

a.) Amendment to the Claims

Claims 1-30 (Cancelled).

31. (Currently Amended) A process for producing a sugar chain or complex carbohydrate, which comprises:

selecting, as an enzyme source, the sugar chain synthesizing agent ~~according to claim 1 or 2~~ which comprises, as an active ingredient, a polypeptide among the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:1,

(b) a polypeptide comprising an amino acid sequence of positions 41-397 in the amino acid sequence represented by SEQ ID NO:1,

(c) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:2,

(d) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:2,

(e) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:3,

(f) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:3,

(g) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:4, and

(h) a polypeptide comprising an amino acid sequence of positions 62-378 in the amino acid sequence represented by SEQ ID NO:4,

or wherein the polypeptide comprises an amino acid sequence in which one or more amino acids are deleted, substituted or added in an amino acid sequence according to any of (a)-(h), and having an activity involved in the synthesis of a poly-N-acetyllactosamine sugar chain;

allowing

(a) (1) the enzyme source,

(b) (2) an acceptor substrate selected from i) N-acetyllactosamine (Galb1-4GlcNAc), Galb1-3GlcNAc or lactose (Galb1-4Glc), ii) an oligosaccharide having an N-acetyllactosamine, Galb1-3GlcNAc or lactose structure at the non-reducing end, and iii) a complex carbohydrate having an N-acetyllactosamine, Galb1-3GlcNAc or lactose structure at the non-reducing terminal, and

(c) (3) uridine-5'-diphosphate N-acetylglucosamine

to be present in an aqueous medium to produce and accumulate a sugar chain or complex carbohydrate in which N-acetylglucosamine is added to a galactose residue of the acceptor substrate via a b1,3-linkage; and

recovering the sugar chain or complex carbohydrate from the aqueous medium.

32. (Original) A process for producing a sugar chain or complex carbohydrate to which galactose is added, which comprises:

selecting, as an acceptor substrate, the N-acetylglucosamine-added reaction product obtained by the method according to claim 31;

allowing

(a) the acceptor substrate,

(b) a GlcNAc b1,4-galactosyltransferase, and

(c) uridine-5'-diphosphogalactose are allowed to be present in an aqueous medium to produce and accumulate a sugar chain or complex carbohydrate in which galactose is added to N-acetylglucosamine residue at the non-reducing terminal of the acceptor substrate via a  $\beta$ 1,4-linkage; and

recovering the galactose-added sugar chain or complex carbohydrate from the aqueous medium.

33. (Currently Amended) A process for producing a sugar chain or complex carbohydrate to which a poly-N-acetylglucosamine sugar chain is added, which comprises:

selecting, as an enzyme source, the sugar chain synthesizing agent ~~according to claim 1 or 2~~ which comprises, as an active ingredient, a polypeptide among the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:1,

(b) a polypeptide comprising an amino acid sequence of positions 41-397 in the amino acid sequence represented by SEQ ID NO:1,

(c) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:2,

(d) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:2,

(e) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:3,

(f) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:3,

(g) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:4, and

(h) a polypeptide comprising an amino acid sequence of positions 62-378 in the amino acid sequence represented by SEQ ID NO:4,

or wherein the polypeptide comprises an amino acid sequence in which one or more amino acids are deleted, substituted or added in an amino acid sequence according to any of (a)-(h), and having an activity involved in the synthesis of a poly-N-acetyllactosamine sugar chain;

allowing

(a) (1) the enzyme source,

(b) (2) a GlcNAc b1,4-galactosyltransferase,

(c) (3) an acceptor substrate selected from i) N-acetyllactosamine (Galb1-4GlcNAc), Galb1-3GlcNAc or lactose (Galb1-4Glc), ii) an oligosaccharide having an N-acetyllactosamine, Galb1-3GlcNAc or a lactose structure at the non-reducing end, iii) a complex carbohydrate having an N-acetyllactosamine, Galb1-3GlcNAc or a lactose structure at the non-reducing terminal, and iv) the reaction product obtained by the process according to claim 31 or 32,

(d) (4) uridine-5'-diphospho-N-acetylglucosamine, and

(e) (5) uridine-5'-diphosphogalactose

to be present in an aqueous medium to produce and accumulate a sugar chain or complex carbohydrate in which a poly-N-acetyllactosamine sugar chain is added to the non-reducing terminal of the acceptor substrate;

recovering the poly-N-acetyllactosamine sugar chain-added sugar chain or complex carbohydrate from the aqueous medium.

34. (Currently Amended) A process for producing a sugar chain or complex carbohydrate, which comprises:

culturing a transformant carrying a recombinant DNA obtained by inserting a DNA encoding a polypeptide which is the active ingredient of the sugar chain synthesizing agent ~~according to claim 1 or 2~~ which comprises, as an active ingredient, a polypeptide among the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:1,

(b) a polypeptide comprising an amino acid sequence of positions 41-397 in the amino acid sequence represented by SEQ ID NO:1,

(c) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:2,

(d) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:2,

(e) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:3,

(f) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:3,

(g) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:4, and

(h) a polypeptide comprising an amino acid sequence of positions 62-378 in the amino acid sequence represented by SEQ ID NO:4,

or wherein the polypeptide comprises an amino acid sequence in which one or more amino acids are deleted, substituted or added in an amino acid sequence according to any of (a)-(h), and having an activity involved in the synthesis of a poly-N-

acetyllactosamine sugar chain into a vector in a medium to produce and accumulate a sugar chain comprising a saccharide selected from the group consisting of a saccharide having a GlcNAcb1-3Galb1-4GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-3GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-4Glc structure, a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4GlcNAc structure wherein n is 1 or more, and a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4Glc structure wherein n is 1 or more, or a complex carbohydrate comprising the sugar chain, in the culture; and

recovering the sugar chain or complex carbohydrate from the culture.

35. (Original) The process according to claim 34, wherein the transformant is a microorganism, an animal cell, a plant cell or an insect cell.

36. (Currently Amended) A process for producing a sugar chain or complex carbohydrate, which comprises:

rearing a non-human transgenic animal carrying a recombinant DNA obtained by inserting a DNA encoding a polypeptide which is the active ingredient of the sugar chain synthesizing agent ~~according to claim 1 or 2~~ which comprises, as an active ingredient, a polypeptide among the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:1,

(b) a polypeptide comprising an amino acid sequence of positions 41-397 in the amino acid sequence represented by SEQ ID NO:1,

(c) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:2,

(d) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:2,

(e) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:3,

(f) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:3,

(g) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:4, and

(h) a polypeptide comprising an amino acid sequence of positions 62-378 in the amino acid sequence represented by SEQ ID NO:4,

or wherein the polypeptide comprises an amino acid sequence in which one or more amino acids are deleted, substituted or added in an amino acid sequence according to any of (a)-(h), and having an activity involved in the synthesis of a poly-N-acetyllactosamine sugar chain into a vector to produce and accumulate a sugar chain comprising a saccharide selected from the group consisting of a saccharide having a GlcNAcb1-3Galb1-4GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-3GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-4Glc structure, a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4GlcNAc structure wherein n is 1 or more, and a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4Glc structure wherein n is 1 or more, or a complex carbohydrate comprising the sugar chain, in the animal; and

recovering the sugar chain or complex carbohydrate from the animal.

37. (Currently Amended) A process for producing a sugar chain or complex carbohydrate, which comprises:

cultivating a transgenic plant carrying a recombinant DNA obtained by inserting a DNA encoding a polypeptide which is the active ingredient of the sugar chain synthesizing agent ~~according to claim 1 or 2~~ which comprises, as an active ingredient, a polypeptide among the following (a), (b), (c), (d), (e), (f), (g) and (h):

(a) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:1,

(b) a polypeptide comprising an amino acid sequence of positions 41-397 in the amino acid sequence represented by SEQ ID NO:1,

(c) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:2,

(d) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:2,

(e) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:3,

(f) a polypeptide comprising an amino acid sequence of positions 45-372 in the amino acid sequence represented by SEQ ID NO:3,

(g) a polypeptide comprising the amino acid sequence represented by SEQ ID NO:4, and

(h) a polypeptide comprising an amino acid sequence of positions 62-378 in the amino acid sequence represented by SEQ ID NO:4,

or wherein the polypeptide comprises an amino acid sequence in which one or more amino acids are deleted, substituted or added in an amino acid sequence according to any of (a)-(h), and having an activity involved in the synthesis of a poly-N-acetyllactosamine sugar chain into a vector to produce and accumulate a sugar chain comprising a saccharide selected from the group consisting of a saccharide having a



GlcNAcb1-3Galb1-4GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-3GlcNAc structure, a saccharide having a GlcNAcb1-3Galb1-4Glc structure, a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4GlcNAc structure wherein n is 1 or more, and a saccharide having a (Galb1-4GlcNAcb1-3)<sub>n</sub>Galb1-4Glc structure wherein n is 1 or more, or a complex carbohydrate comprising the sugar chain, in the plant; and

recovering the sugar chain or complex carbohydrate from the plant.

38. (Currently Amended) The process according to claim 31, wherein the complex carbohydrate is a complex carbohydrate selected from a glycoprotein, a glycolipid, a proteoglycan, a glycopeptide, a lipopolysaccharide, a peptidoglycan, and a glycoside in which a sugar chain is bound to a steroid compound.

39. (Original) The process according to claim 36, wherein said production and accumulation are carried out in milk of the animal.

Claims 40-61 (Cancelled).